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# WESTERN LARCH

## . . . *an American wood*

Western larch, largest of the American larches, is one of the most important species of the northern Rockies. It is one of the hardest and strongest softwoods, and is especially useful for construction lumber, for telephone and transmission poles, and in the better lumber grades, for interior paneling and trim. It is now used extensively for plywood. The natural sugars in western larch can be easily extracted and refined for numerous chemical products.

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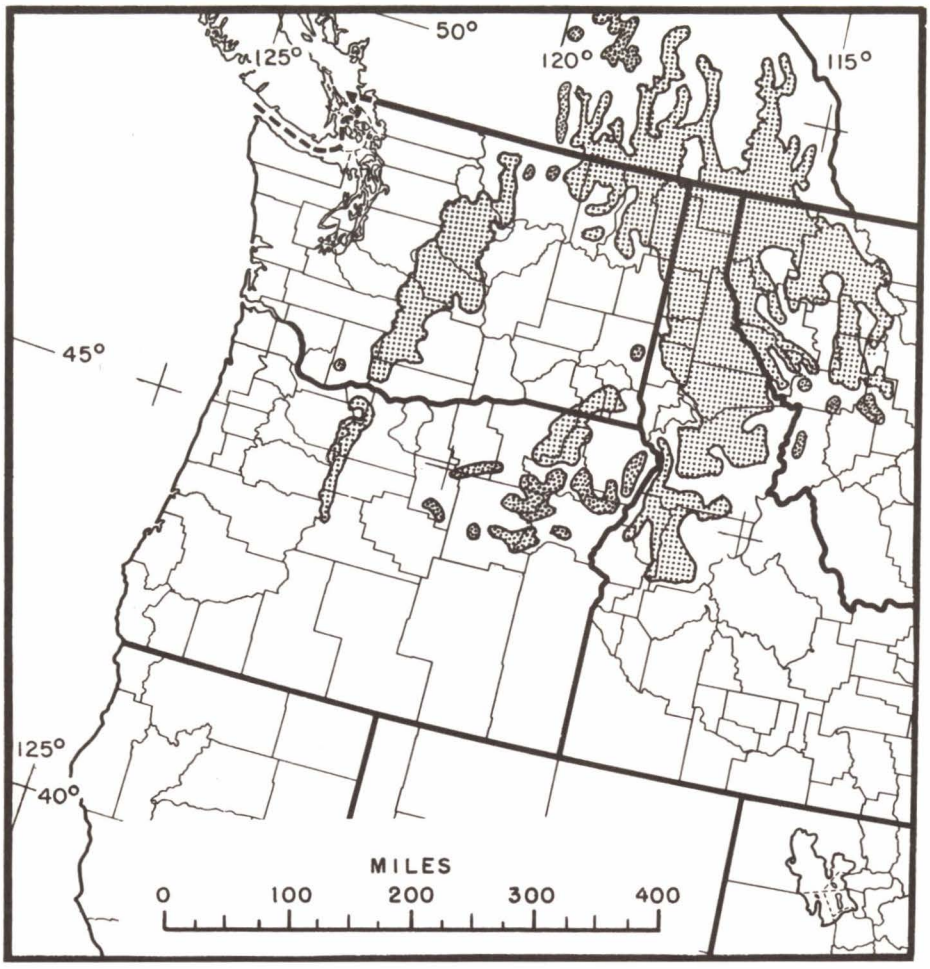


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**Figure 1.—Natural range of western larch.**

**Cover: F-320930**

# WESTERN LARCH

## . . . an American wood

Edward S. Kotok[1]

### DISTRIBUTION

Western larch (*Larix occidentalis* Nutt.) occurs only in the Upper Columbia Basin of North America. It grows from southeastern British Columbia through western Montana west of the Continental Divide to an area in the Bitterroot Mountains. It extends southward to the Wallowa and Blue Mountains of eastern Oregon (fig. 1).

Western larch grows best in cool climates on deep, porous soils of mountain slopes and valleys that may be gravelly, sandy, or loamy in texture. It attains its largest size in western Montana.

Western larch characteristically occupies northerly exposures, valley bottoms, benches, and rolling topography. It occurs at 2,000 feet to 5,500 feet elevation at its northern range and up to 7,000 feet in the south. This species sometimes grows in nearly pure stands in western Montana and northern Idaho, but is more generally found in mixture with Douglas-fir, western white pine, ponderosa pine, western hemlock, grand fir, lodgepole pine, Engelmann spruce, western redcedar, and subalpine fir.

### DESCRIPTION AND GROWTH

Western larch is one of the few deciduous conifers in North America. Its needles fall off each winter to be replaced by new ones in the spring. The trunks of mature trees are frequently free of limbs for considerable height, with little taper, yet are thick at the butt end. The crowns are usually short, open, and essentially pyramidal. In summer, this species is easily recognized by its light green foliage and in winter by the absence of needles.

The deciduous needles are from 1 to 1-¾ inches long, are three-angled in cross section, and are a lustrous light green (fig. 2). New needles generally appear in middle or late June along with new shoot growth. Needles turn brown and drop off following fall frosts, generally in October or November.

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**Figure 2.—Needles and cones of western larch.**

Western larch cones are from 1 to 1-½ inches long, purplish red to reddish brown, oblong, and stand erect on the branchlets. The seeds are small, about ¼-inch long with ½-inch fragile wings. There are about 140,000 seeds to the pound.

The bark on young trees is thin and gray, becoming reddish brown to cinnamon brown and scaly on older trees (fig. 3). Bark on very old trees is flat-plated and has deep irregular fissures. Due to their thick bark, older trees are more fire-resistant than their associated species.

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NOTE: This publication supersedes unnumbered publication *Western Larch*, issued 1945.

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**Figure 3.—Bark of western larch.**

Western larch is a long-lived species, frequently reaching 700 years of age or more. One tree in western Montana measured 91 inches in diameter at breast height, but overmature trees (250-400 years old) generally range from 2 to 4 feet in diameter and 100 to 180 feet in height. Trees average about 90 feet in height at 120 years.

Western larch has a well-developed root system which protects it against being blown by high winds. Although some seeds are produced in all areas every year, good seed crops only occur at about 5-year intervals in most locations.

## COMMON NAMES

Western larch is frequently called tamarack or western tamarack. It is also known as hackmatack larch, Montana larch, mountain larch, and larch. Products manufactured from this species are almost always referred to as being made of larch.

## RELATED COMMERCIAL SPECIES

In the construction-lumber industry western larch and Douglas-fir are generally sold together under the name fir-larch. However, plywood, poles, and interior paneling are sold, almost without exception, as larch. In these latter uses it is rarely mixed with other species.

## SUPPLY

Western larch occupies an estimated 3.5 million acres in Montana, Idaho, Washington, and Oregon. More than half of this acreage is in western Montana. Idaho has the second largest area of this species.

The estimated total net volume of commercial sawtimber is 41 billion board feet with Montana, again, containing slightly more than half. The net volume of growing stock which includes smaller trees is estimated to be 8 billion cubic feet. About half of this volume grows in Montana.

## PRODUCTION

Western larch lumber production has exceeded 200 million board feet annually since 1915, except during the depression of the 1930's when production of this species, along with most others, was at times below 100 million board feet. The greatest single year, so far, was 1959 when an estimated 672 million board feet of lumber was produced (fig. 4).

Western larch is an important species for telephone and transmission poles, piling, and other related roundwood products. In Montana, Idaho, and northeastern Washington alone, an estimated 1.4 million poles were produced between 1947 and 1962. There has been a gradual decline in production since 1947, when an estimated 222,000 western larch poles were produced, and production now averages about 40,000 per year.

Western larch has been an important plywood species, especially in Montana where the first mill was constructed in 1953. In 1966 an estimated 118 million board feet of logs were converted into plywood in Idaho and Montana.

Western larch is highly susceptible to dwarfmistletoe (*Arceuthobium campylopodum* forma *laricis*) which can seriously reduce growth or even kill infected trees. The species is also infected by three other important diseases—the brown trunk rot, red ring rot, and needlecast. The conk, or fruiting body, of brown trunk rot, also known as quinine fungus, is collected for use in the chemical industry. Approximately 5,000 pounds of these conks are collected annually.

The most serious insect enemy of western larch is the larch casebearer (*Coleophora laricella* Hbn.), an insect that was first identified in 1957 in north Idaho and now nearly covers the range of western larch. Other insect pests include the spruce budworm, larch sawfly, and the larch budmouth.

## CHARACTERISTICS AND PROPERTIES

The sapwood of western larch ranges from whitish to pale straw-brown and is generally less than 1 inch wide. The heartwood is a distinctive russet or reddish brown, in some instances resembling cedar. The wood has a greasy feeling, but has no particular odor or

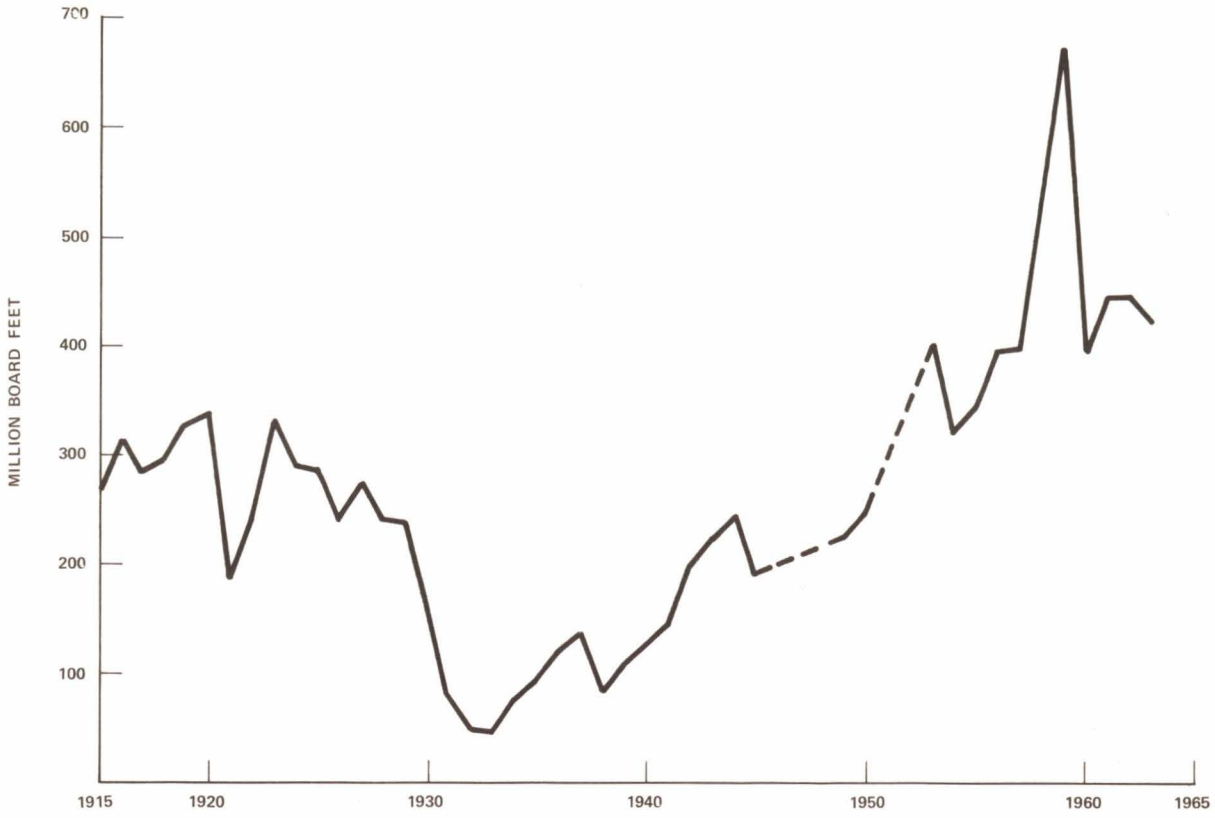


**Figure 4.—Western larch lumber production, 1915-1963.**

taste. It is one of the heavier and harder softwoods, is strong in bending and endwise compression, stiff, and moderately high in shock resistance. Although it splits rather easily this wood has a moderately high nail-holding capacity when blunt-pointed nails are used. Western larch occasionally contains ring shake, or growth-ring crack, especially in the lower parts of the tree. It is easy to glue and takes stain readily, but does not hold paint especially well. Western larch is as easy to dry as the other dense softwoods but exudes sugars to the surface when dried at high temperatures, such as those used in veneer drying. It is considered only moderately resistant to decay organisms when used in applications that encourage decay.

Because of the high levels of natural sugars, western larch is not well suited for concrete forms. These sugars react chemically with the concrete and prevent proper curing.

## PRINCIPAL USES

Western larch has always been important in construction that requires a wood having high strength and hardness. It is used interchangeably with Douglas-fir for general construction lumber or plywood. Knot-free lumber serves extensively for interior paneling because of its distinctive appearance and durability. Edge-grained lumber is used for flooring. General applications of western larch include industrial crating, pallets, and railway-car construction.

Although western larch has sometimes served as railroad ties, this use is now declining. It is used extensively for transmission poles and telephone poles, especially where long lengths and high strengths are needed.

Because of its hardness and resistance to splintering, there is some use of western larch for mine-shaft guides in deep underground mines. High-speed underground mine hoists run along these guides in lifting personnel and ore.

The residues from western larch sawmills and plywood mills are used in pulpmills in Idaho, Montana, Washington, and Oregon.

In at least one factory, western larch chips are soaked in water to remove the natural sugar, galactan, which is further refined and used by the chemical and pharmaceutical industries. The chips are then used for paper pulp, as are chips from factories that do not extract galactan.

Western larch provides considerable pleasure to many outdoor recreationists as it is frequently a large, dominant tree and its lacelike foliage adds pleasant splashes of yellow to the fall scene. This spectacular tree occurs throughout the forests of Montana, Idaho, and northeastern Washington.

## REFERENCES


Gill, Thomas G., and Robert B. Phelps.
1969. Wood used in manufacturing industries. U.S. Dep. Agric. Stat. Bull. 440, 101 p., illus.

Harlow, W. M., and E. S. Harrar.
1968. Textbook of dendrology. American Forestry Series. Ed. 5, 512 p., illus. McGraw-Hill Book Co., New York.

Little, Elbert L., Jr.
1953. Checklist of native and naturalized trees of the United States (including Alaska). USDA Agric. Handb. 41, 472 p.

Lowery, David P., and W. C. Schmidt.
1968. Effect of thinning on the specific gravity of western larch. USDA For. Serv. Res. Note INT-70, 6 p.

Panshin, A. J., Carl de Zeeuw, and H. P. Brown.
1964. Textbook of wood technology, Vol. I—Structures, identification, uses, and properties of the commercial woods of the United States. Ed. 2, 643 p., illus.

Setzer, T., and A. Wilson.
1970. Timber products in the Rocky Mountain states, 1966. USDA For. Serv. Res. Bull. INT-9.

USDA Forest Products Laboratory.
1955. Wood handbook. USDA Agric. Handb. 72, 528 p., illus.

USDA Forest Products Laboratory.
1956. Wood—colors and kinds. USDA Agric. Handb. 101, 36 p., illus.

USDA Forest Service.
1965. Silvics of forest trees of the United States. USDA Agric. Handb. 271, 762 p., illus.

USDA Forest Service.
1965. Timber trends in the United States. USDA For. Serv. Res. Rep. 17, 235 p., illus.

Wilson, A. K.
1963. Commercial pole production in the northern Rocky Mountain area in 1962. USDA For. Serv. Res. Note INT-9.

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